ADF&G TECHNICAL DATA REPORT NO. 98
(Limited Distribution)

STATE OF ALASKA
Bill Sheffield, Governor

CATCH AND ESCAPEMENT STATISTICS FOR COPPER AND BERING RIVER SOCKEYE (Oncorhynchus nerka), CHINOOK (O. tshawytscha), AND COHO SALMON (O. kisutch), 1982

By:
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September 1983

ALASKA DEPARTMENT OF FISH AND GAME
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Don W. Collinsworth
Commissioner

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Data presented in these reports is intended to be final, however, some revisions may occasionally be necessary. Minor revisions will be made via errata sheets. Major revisions will be made in the form of revised reports.

CATCH AND ESCAPEMENT STATISTICS FOR COPPER AND BERING RIVER SOCKEYE *(Oncorhynchus nerka)*, CHINOOK *(O. tshawytscha)*, AND COHO SALMON *(O. kisutch)*, 1982

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September 1983

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ABSTRACT

Abundance, age, sex, and size data are summarized for 1982 returns of sockeye *(Oncorhynchus nerka)*, chinook *(O. tshawytscha)*, and coho salmon *(O. kisutch)* to the Copper and Bering River districts. Weekly and season catches of sockeye salmon and season catches of chinook salmon from the Copper River District are apportioned by sex and age. Age compositions of samples of sockeye catches in the Bering River District and coho salmon in the Copper and Bering River districts are presented but not used to apportion catches. Early, middle, and late portions of the catches in the Copper River subsistence fishery are apportioned by sex and age. Subsistence fishery sample data are also used to apportion sonar counts of early, middle, and late portions of the upper Copper River sockeye escapement by sex and age. Escapement to one significant upper Copper River sockeye salmon run not intercepted by the subsistence fishery was apportioned by sex, age, and size based on weir counts and samples. Spawning ground samples for ten sockeye salmon runs returning to the Copper River Delta and three returning to the Bering River were used to apportion aerial survey estimates of those escapements by age, sex, and size. Sockeye catches in the Copper River District were predominantly fish aged 1.3 and 1.2. The ratio of fish aged 1.3 to fish aged 1.2 decreased steadily from mid-May to late June then fluctuated for the remainder of the season. Copper River District chinook catches were mostly fish aged 1.3 and 1.4 and there was no significant temporal shift in the ratio of the two age groups. Sockeye escapement to the upper Copper River was predominantly fish aged 1.3 and 1.2. Age compositions of sockeye salmon escapements to the Copper River Delta and Bering River were varied and there were larger contributions from additional age groups.

FOREWORD

This is the first in a series of annual catch and escapement reports for returns of sockeye *(Oncorhynchus nerka)*, chinook (*O. tshawytscha)*, and coho salmon *(O. kisutch)* to the Copper and Bering Rivers. The report includes summaries of commercial and subsistence catches, available escapement estimates, and estimates of total return by age, sex, and size for sockeye salmon and summaries of catches of chinook and coho salmon. Results of a feasibility study indicate that for some brood years it is also possible to estimate the run composition of the Copper and Bering River sockeye salmon catches with scale pattern analysis. Estimates of the run composition of the 1982 Copper River commercial catch of sockeye salmon based on this technique will appear in a future publication. The catch and escapement data presented in this report coupled with future run-specific catch composition estimates will make possible the quantitative estimates of production by run necessary for better management of the resource.

INTRODUCTION

The Copper River and Bering River commercial fishing districts are located on the Gulf of Alaska east of Prince William Sound (Figure 1). The Copper River District (212) is bounded by Cape Martin on the west and Hook Point, on Hinchinbrook Island, to the east, and is divided into three subdistricts (10, 20, and 30). The Bering River District (200) is bounded by Cape Martin to the west and Cape Suckling to the east and includes Katalla Bay (Subdistrict 10) and Controller Bay (Subdistrict 20), as well as near-shore waters to the east of Kayak Island (Subdistrict 30).

Sockeye salmon returning to the Copper River, to small watersheds of the Copper River Delta, and the Bering River spawn in lakes, streams, sloughs, and springs; and rear in lakes and sloughs, many of which are glacially occluded. The climate of rearing areas in the Copper River watershed above Wood Canyon is interior, and in the Delta and Bering River it is maritime. The numerous spawning and rearing areas produce several runs of mixed stocks. Chinook salmon spawn and rear in tributaries of the Copper River above Wood Canyon. Coho salmon appear to spawn primarily in the small watersheds of the Copper River Delta and Bering River area but the extent of spawning in the upper Copper River is unknown.

The commercial salmon fishery in Districts 212 and 200 uses drift gill nets. In District 212 most fishing in 1982 occurred in five intertidal channels of the Copper River: Egg Island, Pete Dahl, Grass Island, Kokinhenik, and Softuk. Fishing effort in District 200 was heaviest in Katalla and Controller Bays, but when weather conditions were favorable there was significant effort offshore east of Kayak Island. In 1982 District 212 was opened to sockeye and chinook salmon fishing on 17 May and continued to 30 September. The season for coho salmon opened officially on 9 August and continued to 30 September. After the sockeye salmon season in District 200 opened on 14 June, fishing periods for all three species coincided with those in District 212. Chinook catches in both districts are incidental to sockeye catches, though large-mesh gill nets are permitted.

Subsistence fishermen on the Copper River used dip nets at Chitina and fishwheels from Chitina to Slana (Figure 2) to intercept all upstream stocks of sockeye salmon except those from the Chitina River and the smaller streams emptying into the Copper River between Miles Lake and Chitina. Of the non-intercepted stocks only the one from Long Lake on the Chitina drainage has a sizeable escapement (Roberson 1983). In 1982 the fishery opened on 1 June and continued seven days a week till 30 September. Subsistence fishing is permitted in the commercial fishing districts and is subject to the same timing and gear restrictions as the commercial fishery; reported subsistence catches in 1982 were very small. Chinook salmon were also harvested in the subsistence fishery.

Current Alaska Department of Fish and Game programs for gathering Copper/Bering River catch and escapement data include: (1) enumerating the weekly catch from each subdistrict within Districts 200 and 212; (2) enumerating the daily subsistence harvests; (3) sampling of the commercial fishery each fishing period for age, sex, size, and destination of fish in the catch; (4) sampling the subsistence harvest to estimate age, sex, and size of fish in the catch; (5) enumerating the escapement to the upper Copper River with sonar; (6) enumerating the escapements to

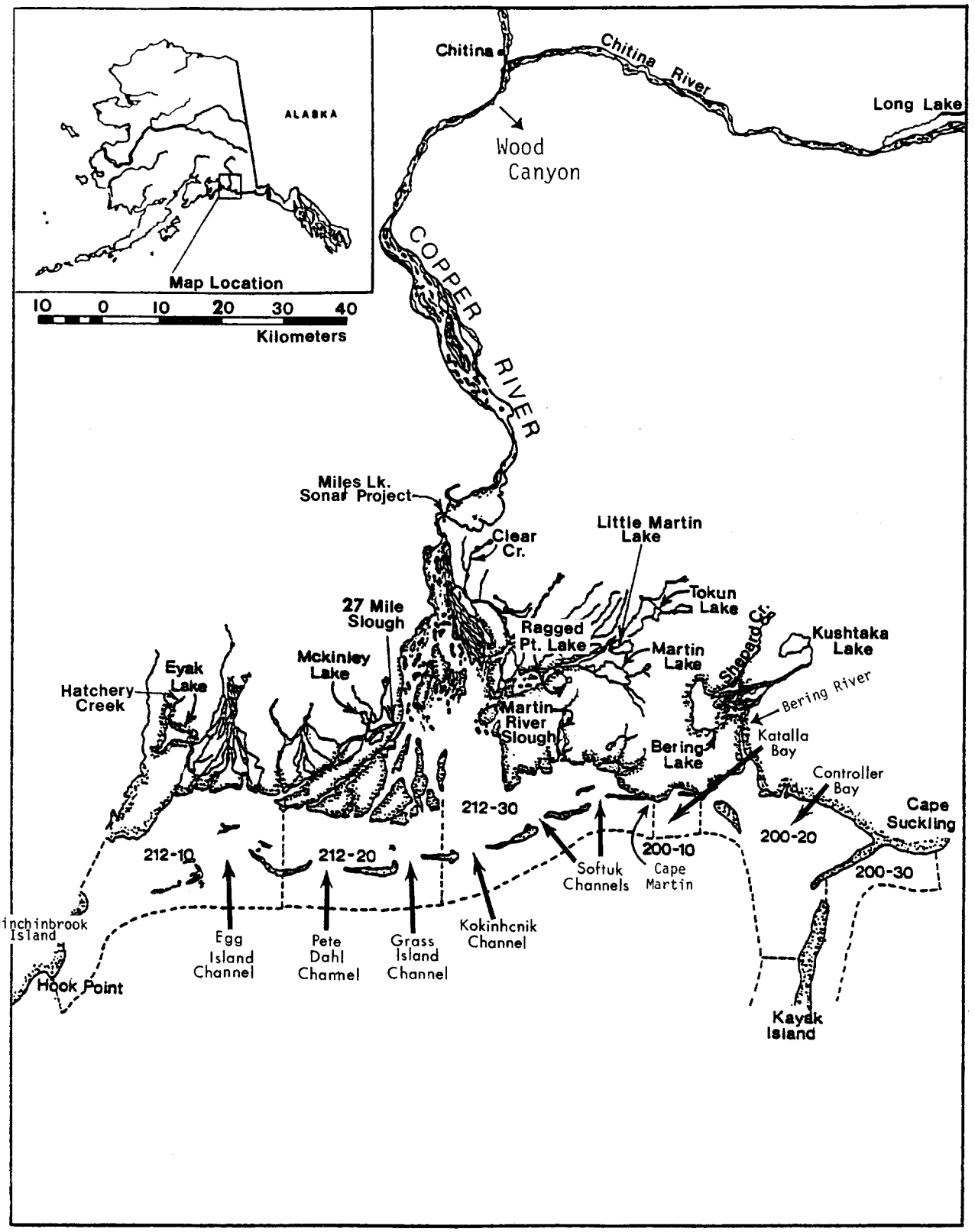

Figure 1. The Copper River area of Prince William Sound showing the fishing districts for the Copper River and Bering River areas and the sampling locations for runs of sockeye salmon.

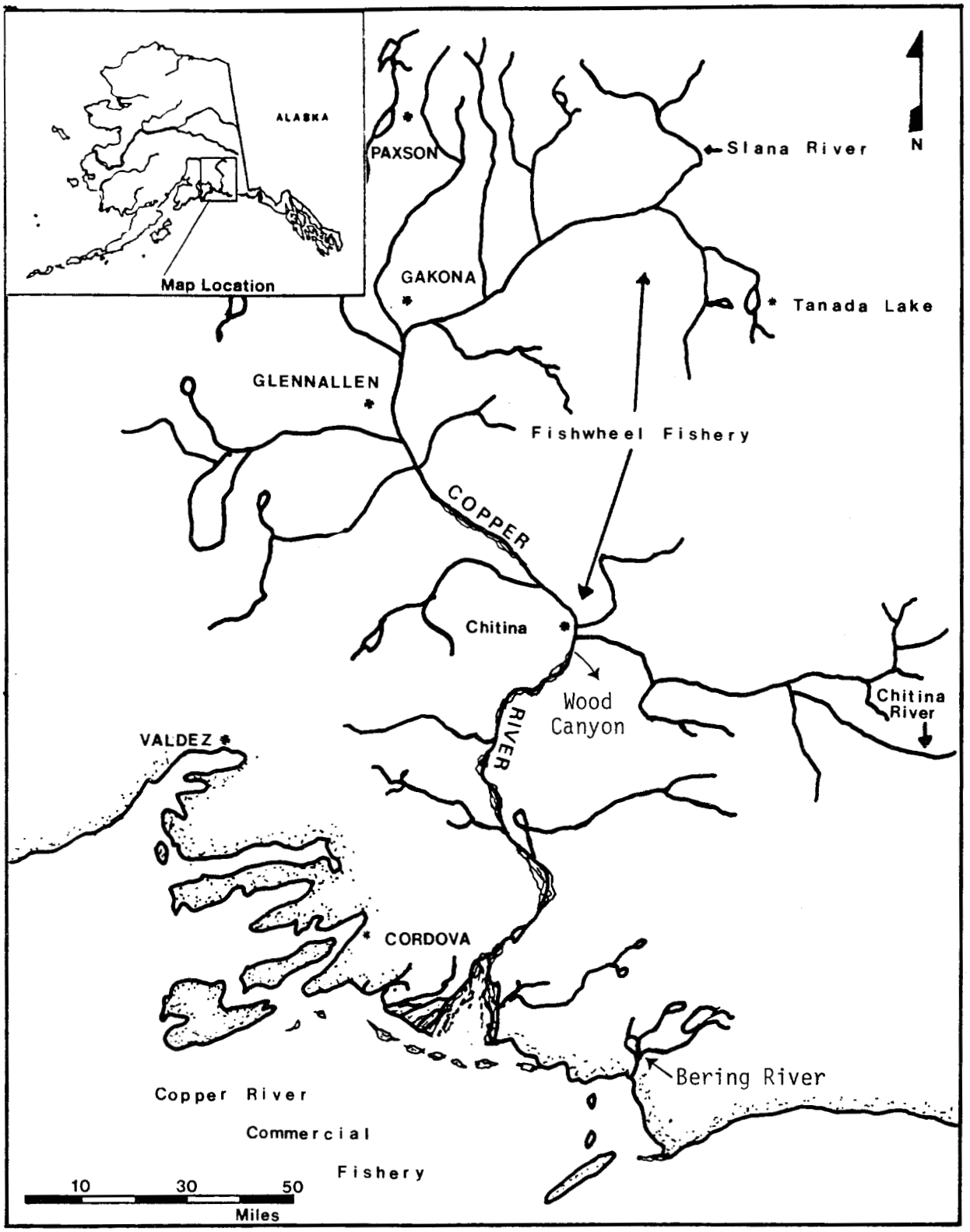

Figure 2. The upper Copper River drainage showing the locations of the dip net and fishwheel subsistence fisheries.

Long Lake with a weir; (7) estimating the magnitude of escapements to the Copper River Delta, the Bering River, and some areas of the Copper River with aerial surveys; and (8) sampling fish on the spawning grounds of the Copper River Delta, Bering River, and Long Lake to estimate the age, sex, and size of fish and to obtain standards for scale pattern analysis. Basic fisheries statistics from these programs are reported in the Alaska Department of Fish and Game Annual Management Report series and Prince William Sound Data Reports.

This report presents available statistics on the harvests from the commercial and subsistence salmon fisheries and on the escapements from these fisheries. The estimated mean length of fish by sex and age is reported for each sampled fishery and escapement.

METHODS

Overview

Copper River sockeye salmon which spawn upstream of Wood Canyon are grouped into the upper Copper River run consisting of all stocks intercepted by the dip net and fishwheel subsistence fishery, and the Long Lake run which is not significantly intercepted. There are other runs on the Chitina River and other smaller streams between Miles Lake and Chitina but they are very small in comparison to the Long Lake run. The upper Copper River run has early, middle, and late components, each composed of several stocks with similar migratory timing (Merritt and Roberson, in press). Stocks returning to the Delta are grouped into many runs: Eyak Lake, McKinley Lake, 27-Mile Slough, 39-Mile Creek, Martin River Slough, Ragged Point Lake, Martin Lake, Little Martin Lake, and Tokun Lake. Stocks from the Bering River are grouped into runs to Bering Lake, Kushtaka Lake, and Shepard Creek. Chinook salmon stocks are grouped into a Copper River run, and coho salmon are grouped into Copper River and Bering River runs.

Catches:

Commercial catch data used in this report were compiled by the Division of Commercial Fisheries for each management district for each week of the fishing season and are based on tabulations of individual records of sales by fishermen (fish tickets). Daily subsistence catches are from Roberson (1982) and are minimum numbers because not all permit holders reported their catches.

Escapements:

The sonar project at Miles Lake counted the entire upper Copper River sockeye salmon escapement including the escapement to Long Lake. Escapement upstream of the subsistence fishery was estimated by subtracting the subsistence catches and weir counts from Long Lake from the sonar counts. Aerial estimates of the other small runs not intercepted by the subsistence fishery are imprecise counts and are insignificant in comparison to the escapement to Long Lake, and were not subtracted from sonar counts when estimating escapement upstream of the subsistence fishery. To estimate the early, middle, and late escapements to the upper Copper River, the sonar counts were lagged to account for time of passage of fish upstream

to the subsistence fishery. Mean lag times were approximated from a linear regression of travel rate against date calculated for historic tagging data (Merritt and Roberson, in preparation). Based on the same study, Long Lake counts were subtracted from the lagged sonar estimates for the late portion of the run.

Aerial surveys were used to estimate the sizes of escapements of sockeye and coho salmon to the Copper River Delta and to the Bering River and of chinook salmon to the upper Copper River. Reported estimates are the peak aerial estimates for the season for each escapement; when aerial estimates were made for parts of areas (i.e., Martin River Lake proper and its outlet), the maximum among the areas is listed to avoid double and triple counting of fish. Although total escapement estimates from aerial surveys are often very imprecise, they are used because they are the best information available on the escapement of these runs.

Sampling Programs

One scale was collected from each sockeye and coho salmon sampled, and three scales were collected from each chinook salmon. Scales were taken from the left side of the body two rows above the lateral line on the diagonal scale row running from the posterior base of the dorsal fin to the anterior base of the anal fin (INPFC 1963). Scales were mounted on gum cards and impressions made in cellulose acetate (Clutter and Whitsel 1956). Sex was determined by inspection of the morphology of fish caught in the fishery and of live fish in the escapement and by inspection of gonads in carcasses on spawning grounds. Length was measured in millimeters from the middle of the eye to the fork of the tail. Otolith samples were taken on the spawning grounds when adequate numbers of carcasses were available.

When possible, sampled fish were aged by inspection of scales. However, when scales from carcasses were partially resorbed, the marine zones were obscure, and marine ages were subsequently determined using the Peterson method of length frequency analysis (Tesch 1970). When available, otoliths were used to determine the marine age of samples taken from carcasses.

Because the catch sampling program for sockeye salmon in District 212 was designed to get time and area-specific data for scale pattern analysis, samples were stratified spatially and temporally. Samplers were stationed aboard tenders located at four of the five main entrance channels to the Copper River Delta. Samples were taken from as many separate deliveries as possible, and sampling effort was spread throughout each opening. Fishing vessel skippers were interviewed during deliveries to determine the entrance in which catches had been made. When samplers could not be aboard tenders, samples were taken at the canneries in Cordova. Cannery sampling increased the probability of obtaining a mixed sample from more than one entrance, though frequently it was possible to interview tender boat skippers to determine where the fish were captured. Because of logistical problems and manpower shortages, sockeye salmon catch samples for District 200 were obtained for only two fishing periods. Chinook and coho salmon were sampled at the canneries in Cordova.

The Copper River subsistence harvest of sockeye salmon was sampled at Chitina from 2 June to 15 August when 95% of the catches were made. Available samples

from dip net and fishwheel harvests were used to estimate age compositions of early, middle, and late components of the catch. No samples were obtained from the limited subsistence catches reported from the commercial fishing districts. The subsistence catches of coho and chinook salmon were not sampled.

Samples from the subsistence catch of sockeye salmon at Chitina were also used as escapement samples for the early, middle, and late components of the upper Copper River run. Long Lake fish were sampled on two consecutive dates at a site below the weir at the outlet of the lake and on the spawning grounds. Delta and Bering River runs were sampled on the spawning grounds. Samples were taken from beach-seined fish and from carcasses.

Age, Sex, and Size Composition of Catches

Because no significant differences were found in the age compositions of spatially stratified samples from the sockeye salmon fishery in District 212, samples from all sites were subsequently combined, and these age compositions were used to apportion weekly catches by sex and age. Because sample sizes and catches after 8 August were small, samples taken between that date and the end of the fishery were pooled. Age and sex compositions of weekly catch samples of chinook salmon were used to apportion weekly catches by age and sex. Sockeye and chinook salmon catches by sex and age for the season are sums of the weekly values weighted by the weekly catch. Similarly, mean length by sex and age was computed for the season from weighted weekly values. Because samples of sockeye salmon from District 200 east of Kayak Island and in Controller Bay were small, age and sex compositions were not calculated. Catch and age statistics for coho salmon are from Randall et al. (1983).

Age compositions of samples from the early, middle, and late components of the dip net and fishwheel subsistence fishery were used to apportion the sockeye salmon catch for those components by age and sex. Season catch by sex and age is the sum of totals for the early, middle, and late components weighted by the catches in those periods. No age composition data are available for catches of chinook and coho salmon.

Age, Sex, and Size Composition of Escapements

Samples from the subsistence harvest at Chitina were considered representative of sockeye salmon returning to the upper Copper River. Estimated age and sex compositions for the early, middle, and late components of the run are the product of compositions of the samples and the catches taken during each of these periods. The estimated period catches by sex and by age were summed to estimate the catch by sex and by age for the season. The age and sex compositions of weir samples were used to apportion the escapement to Long Lake by sex and age and to compute mean lengths at sex and age.

Age and sex composition of the sockeye salmon escapements to the Copper River Delta and Bering River were estimated with peak aerial survey estimates and age compositions of samples. Because it was not feasible to obtain age, sex, and size samples which were well stratified through time for analysis of temporal changes in the age compositions, samples from different dates were pooled and used to compute sample age compositions. Because peak aerial surveys are not

complete escapement counts, escapement estimates by age and sex are presented to show only the relative abundance of escapements and should not be interpreted as representing Delta and Bering River escapements in absolute numbers. No data are available for the age and sex compositions of coho salmon escapements to the Delta or to the Bering River nor of the mean lengths of these fish.

RESULTS

Catches

In the Copper River District 1,193,584 sockeye, 49,162 chinook, and 452,846 coho salmon were harvested. Fishing for sockeye and chinook salmon commenced on 17 May and continued with two fishing periods every week thereafter until 30 September. Fishing for coho salmon began on 9 August and fishing effort targeted on that species for the remainder of the season. Sockeye catches were highest in the first two weeks of fishing, fishing effort was high through 10 July, and 97% of the season total catch had occurred by that date (Table 1). Catches of chinook salmon were highest in the 7 June to 9 June fishing period and 99% of the catch was landed by 23 June (Table 2). Coho salmon catches peaked in the 30 August to 2 September fishing period (Table 2).

In the Bering River District, 131,645 sockeye, and 144,931 coho salmon were harvested. Fishing began on 14 June and continued with two fishing periods per week through 30 September. Catches of sockeye salmon rose rapidly to a peak during the fishing period which began on 21 June and diminished gradually; after 9 August they were incidental to the catches of coho salmon (Table 3). Coho salmon catches were highest during the 30 August to 2 September fishing period.

The subsistence fishery in the upper Copper River harvested a reported 96,798 sockeye, 2,532 chinook, and 1,246 coho salmon. Fishermen using dip nets captured 61.7% of the sockeye salmon and fishermen using fishwheels captured 38.3%. Highest sockeye salmon catches for both gear types occurred in June but continued to number in the 100's each day through the second week in August. Chinook catches were highest in June and very infrequent by the end of July. The largest coho salmon catches were in early September.

Escapements

The escapement of sockeye salmon past the Miles Lake sonar site was 467,306 fish. Counts were recorded from 24 May to 5 August with the highest daily count of 47,303 on 28 May. Daily counts of 7,000 to 15,000 were the norm from late May until mid-June, and daily counts of 1,000 to 7,000 fish continued until the end of July (Table 4). The escapement past the weir at Long Lake from 30 July 20 23 September was 28,064. Daily counts were quite variable, and the maximum count of 4,100 occurred very late in the season (Table 5). Chinook salmon aerial survey estimates from 17 sites on the upper Copper River drainage totaled 4,124 fish, and ranged from 6 to 1,260 among sites (Randall et al., 1983). No coho salmon were observed during aerial surveys of the upper Copper River drainage (Randall et al. 1983).

Table 1. Sockeye salmon commercial catches and effort in the Copper River District by fishing period and statistical week, and cumulative catches by fishing period in numbers of fish and as a percent of the total catch, 1982.

Statistical Week	Period Dates	Fishing Time (Hrs)	Effort (Boats)	Period Catch	Week Catch	Cummulative Catch	Cumulative as Percent of Total
21	5/17-5/18	36	6	2,778		2,778	2.3
	5/20-5/22	36	396	237.996	240,774	240,774	20.2
22	5/25-5/26	36	450	228,959		469,773	39.4
	5/28-5/29	24	438	77,837	306,796	547,570	45.9
23	5/31-6/01	24	444	67,105		614,675	51.5
	6/03-6/05	36	438	85,434	152,539	700,109	58.7
24	6/07-6/09	48	402	126,241		826,350	69.2
	6/10-6/12	36	276	58,827	185,068	855,177	74.2
25	6/14-6/16	48	438	116,972		1,002,149	84.0
	6/17-6/19	36	367	23,224	140,196	1,025,373	85.9
26	6/21-6/23	48	123	52,535		1,077,908	90.3
	6/24-6/26	36	123	14,679	67,214	1,092,587	91.5
27	6/28-6/30	48	64	19,171		1,111,758	93.1
	7/01-7/03	36	64	15,687	34,858	1,127,445	94.5
28	7/05-7/07	48	109	24,063		1,151,508	96.5
	7/08-7/10	36	109	7,270	31,133	1,158,778	97.1
29	7/12-7/14	48	10	1,326		1,160,104	97.2
	7/15-7/17	36	10	312	1,638	1,160,416	97.2
30	7/19-7/21	48	70	9,218		1,169,634	98.0
	7/22-7/24	36	70	5,911	15,129	1,175,545	98.5
31	7/26-7/28	48	87	7,110		1,182,655	99.1
	7/29-7/31	36	87	2,383	9,493	1,185,038	99.3
32	8/02-8/04	48	40	4,660		1,189,698	99.7
	8/05-8/07	36	40	1,032	5,692	1,190,730	99.8
33	8/09-8/12	84	194	1,414		1,192,144	99.9
	8/16-8/19	84	262	1,097	2,511	1,193,241	100.0
34	8/23-8/26	84	348	305		1,193,546	100.0
	8/30-9/02	84	373	31	336	1,193,577	100.0
35	9/06-9/09	84	308	7		1,193,584	100.0
	9/13-9/16	84	134	0	7	1,193,584	100.0

Table 2. Chinook and coho salmon commercial catches and effort in the Copper River District by fishing period and statistical week, and cumulative catches by fishing period in numbers of fish and as a percent of the total catch, 1982.

Statistical Week	Period Dates	Fishing Time (Hrs)	Effort (Boats)	Chinook				Coho			
				Period Catch	Week Catch	Cummulative Catch	Cumulative as Percent of Total	Period Catch	Week Catch	Cummulative Catch	Cummulative as Percent of Total
21	5/17-5/18	36	6	272		272	0.6	0		0	0.0
	5/20-5/22	36	396	5,847	6,119	6,119	12.5	0	0	0	0.0
22	5/25-5/26	36	450	9,368		15,487	31.5	0		0	0.0
	5/28-5/29	24	438	5,323	14,691	20,810	42.3	0	0	0	0.0
23	5/31-6/01	24	444	4,627		25,437	51.7	0		0	0.0
	6/03-6/05	36	438	5,515	10,142	30,952	63.0	0	0	0	0.0
24	6/07-6/09	48	402	7,201		38,153	77.6	0		0	0.0
	6/10-6/12	36	276	3,644	10,845	41,797	85.0	0	0	0	0.0
25	6/14-6/16	48	438	4,442		46,239	94.1	0		0	0.0
	6/17-6/19	36	367	1,367	5,809	47,606	96.8	0	0	0	0.0
26	6/21-6/23	48	123	1,057		48,663	99.0	1		1	0.0
	6/24-6/26	36	123	199	1,256	48,862	99.4	1	2	2	0.0
27	6/28-6/30	48	64	144		49,006	99.7	0		2	0.0
	7/01-7/03	36	64	58	202	49,064	99.8	0	0	2	0.0
28	7/05-7/07	48	109	46		49.110	99.9	1		3	0.0
	7/08-7/10	36	109	11	57	49,121	99.9	30	31	33	0.0
29	7/12-7/14	48	10	4		49,125	99.9	33		66	0.0
	7/15-7/17	36	10	0	4	49,125	99.9	0	33	66	0.0
30	7/19-7/21	48	70	5		49,130	99.9	1,076		1,142	0.3
	7/22-7/24	36	70	3	8	49,133	99.9	1,595	2,671	2,737	0.6
31	7/26-7/28	48	87	6		49,139	99.9	2,784		5,521	1.2
	7/29-7/31	36	87	0	6	49,139	99.9	2,064	4,848	7,585	1.7
32	8/02-8/04	48	40	2		49,141	99.9	13,646		21,231	4.7
	8/05-8/07	36	40	3	6	49,144	100.0	8,764	22,410	29,995	6.6
33	8/09-8/12	84	194	7		49,151	100.0	33,263		63,258	14.0
	8/16-8/19	84	262	8	15	49,159	100.0	78,673	111,936	141,931	31.3
34	8/23-8/26	84	348	3		49,162	100.0	91,868		233,799	51.6
	8/30-9/02	84	373	0	3	49,162	100.0	108,960	200,828	342,759	75.7
35	9/06-9/09	84	308	0		49,162	100.0	80,463		423,222	93.5
	9/13-9/16	84	134	0	0	49,162	100.0	18,476	98,939	441,698	97.5
36	9/20-9/23	84	95	0		49,162	100.0	10,276		451,974	99.8
	9/27-9/30	84	3	0	0	49,162	100.0	890	11,166	452,864	100.0

Table 3. Sockeye and coho salmon commercial catches and effort in the Bering River District by fishing period and statistical week, and cumulative catches by fishing period in numbers of fish and as a percent of the total catch, 1982.

Statistical Week	Period Dates	Fishing Time (Hrs)	Effort (Boats)	Sockeye				Coho			
				Period Catch	Week Catch	Cummulative Catch	Cumulative as Percent of Total	Period Catch	Week Catch	Cummulative Catch	Cummulative as Percent of Total
25	6/14-6/16	48	20	7,735		7,735	5.9	0		0	0.0
	6/17-6/19	36	28	10,677	18,412	18,412	14.0	0	0	0	0.0
26	6/21-6/23	48	44	29,167		47,579	36.1	0		0	0.0
	6/24-6/26	36	44	27,673	56,840	75,252	57.2	0	0	0	0.0
27	6/28-6/30	48	17	12,072		87,324	66.3	0		0	0.0
	7/01-7/03	36	17	10,391	22,463	97,715	74.2	0	0	0	0.0
28	7/05-7/07	48	16	13,579		111,294	84.5	0		0	0.0
	7/08-7/10	36	16	9,131	22,710	120,425	91.5	0	0	0	0.0
29	7/12-7/14	48	9	9,578		130,003	98.8	0		0	0.0
	7/15-7/17	No Effort		0	9,578	130,003	98.8	0	0	0	0.0
30	7/19-7/21	48	8	1,535		131,538	99.9	0		0	0.0
	7/22-7/24	No Effort		0	1,535	131,538	99.9	0	0	0	0.0
31	7/26-7/28	No Effort		0		131,538	99.9	0		0	0.0
	7/29-7/31	No Effort		0	0	131,538	99.9	0	0	0	0.0
32	8/02-8/04	No Effort		0		131,538	99.9	0		0	0.0
	8/05-8/07	No Effort		0	0	131,538	99.9	0	0	0	0.0
33	8/09-8/12	84	1	0		131,538	99.9	63		63	0.0
	8/16-8/19	84	12	32	32	131,570	99.9	6,353	6,416	6,416	4.4
34	8/23-8/26	84	78	74		131,644	100.0	25,457		31,873	22.0
	8/30-9/02	84	102	1	75	131,645	100.0	52,509	77,966	84,382	58.2
35	9/06-9/09	84	104	0		131,645	100.0	40,088		124,470	85.9
	9/13-9/16	84	53	0	0	131,645	100.0	17,768	57,856	142,238	98.1
36	9/20-9/23	84	32	0		131,645	100.0	2,693		144,931	100.0
	9/27-9/30	No Effort		0	0	131,645	100.0	0	2,693	144,931	100.0

Table 4. Sockeye salmon daily and cumulative escapement counts, and cumulative counts as a percent of the total count from the Miles Lake sonar site, 1982.

Date		Escapement in Numbers of Fish		Escapement as Percent of Total	
		Daily	Cummulative	Daily	Cummulative
May	24	90	90	0.0	0.0
	25	493	583	0.1	0.1
	26	1,023	1,605	0.2	0.3
	27	12,091	13,697	2.6	2.9
	28	47,303	61,000	10.1	13.1
	29	19,671	80,671	4.2	17.3
	30	8,781	89,452	1.9	19.2
	31	11,389	100,841	2.4	21.6
Jun	1	15,385	116,226	3.3	24.9
	2	17,213	133,439	3.7	28.6
	3	13,383	146,822	2.9	31.4
	4	12,355	159,177	2.6	34.1
	5	14,806	173,983	3.2	37.2
	6	15,585	189,568	3.3	40.6
	7	12,506	202,074	2.7	43.2
	8	8,430	210,504	1.8	45.0
	9	7,017	217,541	1.5	46.5
	10	7,599	225,120	1.6	48.2
	11	7,879	232,999	1.7	49.9
	12	8,587	241,586	1.8	51.7
	13	9,932	251,518	2.1	53.8
	14	12,551	264,069	2.7	56.5
	15	12,677	276,746	2.7	59.2
	16	13,595	290,341	2.9	62.1
	17	12,030	302,371	2.6	64.7
	18	6,544	308,915	1.4	66.1
	19	4,369	313,284	.9	67.0
	20	3,352	316,636	.7	67.8
	21	3,346	319,982	.7	68.5
	22	4,467	324,449	1.0	69.4
	23	7,031	331,480	1.5	70.9
	24	6,329	337,809	1.4	72.3
	25	4,903	342,712	1.0	73.3
	26	4,416	347,128	.9	74.3
	27	2,732	349,860	.6	74.9
	28	2,174	352,034	.5	75.3
	29	2,130	354,164	.5	75.8
	30	2,313	356,477	.5	76.3
Jul	1	2,190	358,667	.5	76.8
	2	4,420	363,087	.9	77.7
	3	5,751	368,838	1.2	78.9
	4	5,245	374,083	1.1	80.0
	5	4,995	379,078	1.1	81.1
	6	6,300	385,378	1.3	82.5
	7	6,171	391,549	1.3	83.8
	8	3,990	395,539	.9	84.6
	9	2,210	397,749	.5	85.1
	10	2,070	399,819	.4	85.6
	11	1,980	401,799	.4	86.0
	12	3,420	405,219	.7	86.7
	13	4,032	409,251	.9	87.6
	14	4,339	413,590	.9	88.5
	15	4,714	418,304	1.0	89.5
	16	3,561	421,865	.8	90.3
	17	2,925	424,790	.6	90.9
	18	3,413	428,203	.7	91.6
	19	4,296	432,499	.9	92.6
	20	3,920	436,419	.8	93.4
	21	4,049	440,468	.9	94.3
	22	3,871	444,339	.8	95.1
	23	3,099	447,438	.7	95.7
	24	3,061	450,499	.7	96.4
	25	3,374	453,873	.7	97.1
	26	2,596	456,469	.6	97.7
	27	2,247	458,716	.5	98.2
	28	2,375	461,091	.5	98.7
	29	1,426	462,517	.3	99.0
	30	963	463,480	.2	99.2
	31	1,176	464,656	.3	99.4
Aug	1	511	465,167	.1	99.5
	2	942	466,109	.2	99.7
	3	494	466,603	.1	99.8
	4	581	467,184	.1	99.9
	5	122	467,306	.1	100.0

Table 5. Sockeye salmon daily and cumulative escapement counts from the Long Lake weir and cumulative counts as a percent of the total count, 1982.

Date	Escapement in Numbers of Fish		Escapement as Percent of Total	
	Daily	Cummulative	Daily	Cummulative
July 30	47	47	0.2	0.2
31	48	95	0.2	0.3
Aug 1	0	95	0.0	0.3
2	0	95	0.0	0.3
3	0	95	0.0	0.3
4	0	95	0.0	0.3
5	6	101	0.0	0.4
6	31	132	0.1	0.5
7	0	132	0.0	0.5
8	0	132	0.0	0.5
9	0	132	0.0	0.5
10	0	132	0.0	0.5
11	41	173	0.1	0.6
12	178	351	0.6	1.3
13	242	593	0.9	2.1
14	213	806	0.8	2.9
15	1,003	1,809	3.6	6.4
16	633	2,442	2.3	8.7
17	154	2,596	0.5	9.3
18	1,610	4,206	5.7	15.0
19	163	4,369	0.6	15.6
20	328	4,697	1.2	16.7
21	471	5,165	1.7	18.4
22	344	5,509	1.2	19.6
23	1,476	6,985	5.3	24.9
24	1,106	8,091	3.9	28.8
25	197	8,278	0.7	29.5
26	42	8,320	0.1	29.7
27	535	8,855	1.9	31.6
28	1,517	10,372	5.4	37.0
29	0	10,372	0.0	37.0
30	767	11,159	2.7	39.7
31	2,947	14,106	10.5	50.2
Sep 1	15	14,121	0.1	50.3
2	0	14,121	0.0	50.3
3	1,054	15,175	3.8	54.0
4	1,301	16,476	4.6	58.7
5	350	16,826	1.2	59.9
6	1,370	18,196	4.9	64.8
7	2,715	20,911	9.7	74.5
8	0	20,911	0.0	74.5
9	463	21,374	1.6	76.1
10	51	21,425	0.2	76.3
11	220	21,645	0.8	77.1
12	327	21,972	1.2	78.3
13	28	22,000	0.1	78.4
14	589	22,589	2.1	80.5
15	1,091	23,690	3.9	84.4
16	4,110	27,800	14.6	99.0
17	45	27,845	0.2	99.2
18	0	27,845	0.0	99.2
19	219	28,064	0.8	100.0
20	0	28,064	0.0	100.0
21	0	28,064	0.0	100.0
22	0	28,064	0.0	100.0
23	0	28,064	0.0	100.0

The combined sockeye salmon escapement to all Copper River Delta spawning areas based on aerial survey indices was 115,780 (Table 6). Escapement to the numerous spawning sites ranged from tens of fish in Ibek River to tens of thousands at McKinley Lake/Salmon Creek. The timing of peak estimates ranged from early July to mid-August. Escapement emigration to most sites lasted two to three weeks, though a few sites had influxes of new fish through most of June, July, and August. The combined coho salmon escapement to all Copper River Delta spawning areas based on aerial survey indices was 51,310 fish; fish were sighted at 25 locations, and estimates ranged from 50 to 12,500 (Table 7). The high estimate for some escapements were from the 27 August survey, but most were from late September.

Combined sockeye salmon escapement to all Bering River spawning areas based on aerial survey indices was 35,650 (Table 8). Highest estimates were for the Bering Lake/Dick Creek spawning areas. High estimates for all areas occurred in late July and early August, and peak spawning in all areas lasted only two to three weeks. Combined coho salmon escapement to all Bering River spawning areas based on aerial survey indices was 30,000 fish. Coho salmon were sighted at four locations, and peak estimates ranged from 5,000 to 11,500 and occurred in September (Table 9).

Age, Sex, and Size Composition of Catches

Age groups 1.3 and 1.2 dominated the commercial catch of sockeye salmon in the Copper River District (77.0% and 1.37%, respectively; Table 10). The portion of the catch aged 1.3 declined steadily from 88.3% in the first week of fishing to 53.9% in the fishing period which began on 27 June (Table 11). Conversely, in that time interval the portion of fish aged 1.2 steadily increased from 2.9% to to 35.8%. In the following weeks, the ratio of these two age groups fluctuated erratically. Fish aged 0.3 contributed significantly to the small sockeye salmon catches late in the fishery but their contribution to the overall catch was very small.

Age groups 1.3 and 1.4 dominated in the commercial catch of chinook salmon in the Copper River District (52.9% and 25.3%, respectively) (Table 12). There was no significant difference in the age composition among weekly samples until 20 June, and only 6% of catches were made from that date to the end of the season. Fish aged 2.1 dominated the small commercial catch sample of coho salmon in the Copper River District (Table 13).

Age groups 1.3 and 1.2 dominated the catch sample of sockeye salmon from Controller Bay (51.8% and 39.1%, respectively), and age group 1.3 dominated (84.4%) the small sample of sockeye salmon made east of Kayak Island (Table 14). Coho salmon aged 2.1 were the only ones reported in the small coho salmon catch sample from the Bering River District (Table 13).

Sockeye salmon aged 1.3 and 1.2 were 74.2% and 19.0% of the catch from the subsistence fishery in the upper Copper River (Table 15). The portion of fish aged 1.3 declined from the early segment of the run to the middle, but rose to a high of 83.6% in the late segment. Conversely, the portion of fish aged 1.2 increased from the early to the middle segment of the run but declined to a low of 14.0% in the late segment.

Table 6. Aerial survey indices of sockeye salmon escapement to Copper River Delta spawning sites, 1982.

System/Drainage	Survey Locations Grouped by Subsytem or Tributary	Survey Estimates	Subsytem/Tributary Totals	System/Drainage Totals
Eyak River	Power Creek	75	13,575	13,575
	Hatchery Creek	1,800		
	Eyak Lake	11,700		
Ibek Creek	Ibek Creek	35	35	35
Alganik Slough	Salmon Creek [1]	13,500	23,000	23,000
	McKinley Lake	9,500		
26/27 Mile Creek	26/27 Mile Creek	5,500	5,500	5,500
39 Mile Creek	39 Mile Creek	13,000	13,000	13,000
Goat Mtn. Creek	Goat Mtn. Creek	3,000	3,000	3,000
Pleasant Creek	Pleasant Creek	NC	NC	NC [2]
Martin River	Tokun Lake	7,000	8,450	48,170
	Tokun Lake Outlet	300		
	Tokun Springs	1,000		
	Tokun River	150		
	Little Martin Lake	6,000	6,020	
	Little Martin Lake Outlet	20		
	Pot Hole Lake	400	1,900	
	Pot Hole Lake Outlet	1,500		
	Martin Lake Feeders	9,500	14,800	
	Martin Lake	5,300		
	Martin Lake Outlet [3]	0		
	Ragged Point Lake	7,000	13,500	
	Ragged Point Lake Outlet	4,500		
	Ragged Point River	2,000		
	Martin River	3,500	3,500	
Martin River Slough	Martin River Slough	9,500	9,500	9,500
Copper River Delta Total				115,780

[1] Includes estimates for the North Fork and Springs area.

[2] Weather and poor visibility prevented an aerial estimate of escapement at this site.

[3] Included in Martin Lake estimate.

Table 7. Aerial survey indices of coho salmon escapement to Copper River Delta spawning sites, 1982.

System/Drainage	Survey Locations Grouped by Subystem or Tributary	Survey Estimates	Subsytem/Tributary Totals	System/Drainage Totals
Eyak River	Power Creek	0	7,000	7,000
	Hatchery Creek	0		
	Eyak Lake	7,000 [1]		
Ibek Creek	Ibek Creek	1,100	1,100	1,100
19 Mile Creek	19 Mile Creek	200	200	200
Alganik Slough	Salmon Creek [2]	4,650	5,150	5,150
	McKinley Lake	500		
26/27 Mile Creek	26/27 Mile Creek	50	50	50
39 Mile Creek	39 Mile Creek	2,000	2,000	2,000
Goat Mtn. Creek	Goat Mtn. Creek	50	50	50
Pleasant Creek	Pleasant Creek	400	400	400
Martin River	Tokun Lake	350	1,100 [3]	22,860
	Tokun Lake Outlet	50		
	Tokun Springs	200		
	Tokun River	500		
	Little Martin Lake	150	2,650	
	Little Martin Lake Outlet	2,500		
	Pot Hole Lake	0	50	
	Pot Hole Lake Outlet	50		
	Martin Lake Feeders	0	9,000	
	Martin Lake	9,000		
	Martin Lake Outlet [4]			
	Ragged Point Lake	2,500	2,560	
	Ragged Point Lake Outlet	50		
	Ragged Point River	1,825		
	Martin River	7,500	7,500	
Martin River Slough	Martin River Slough	12,500	12,500	12,500
Copper River Delta Total				51,310

[1] Probably includes 1,500 fish seen in Power Creek and 125 fish seen in Hatchery Creek on a later survey.

[2] Includes counts for the North Fork and Springs area.

[3] Probably conservative since 2,000 fish were seen in Tokun River before any fish were seen in the lake or in the lake outlet.

[4] Included in Martin Lake count.

Table 8. Aerial survey indices of sockeye salmon escapements to Bering River spawning sites, 1982.

System/Drainage	Survey Locations Grouped by Subsystem or Tributary	Survey Estimates	Subsystem/Tributary Totals	System/Drainage Totals
Bering River	Shokum Creek	2,000	3,350	35,650
	Kushtaka Lake	1,350		
	Trout Creek	1,000	1,000	
	Clear Creek	3,500	3,500	
	Maxwell Creek	No Count	11,300	
	Carbon Creek	800		
	Shepard Creek	10,500		
	Dick Creek	9,500	16,500	
	Bering Lake	7,000		
Bering River Area Total				35,650

Source: Peter Fridgen, personal communication.

Table 9. Aerial survey indices of coho salmon escapement to Bering River spawning sites, 1982.

System/Drainage	Survey Locations Grouped by Subystem or Tributary	Survey Estimates	Subsytem/Tributary Totals	System/Drainage Totals
Bering River	Shokum Creek	0	0	13,500
	Kushtaka Lake	0		
	Trout Creek	0	0	
	Clear Creek	0	0	
	Maxwell Creek	0	0	
	Carbon Creek	0		
	Shepard Creek	0	0	
	Dick Creek	5,500	13,500	
	Bering Lake	8,000		
Katalla River	Katalla River	11,500	11,500	11,500
Gandil River	Gandil River	Muddy	Muddy	Muddy
Nichawak River	Nichawak River	5,000	5,000	5,000
Bering River Area Total				30,000

Source: Peter Fridgen, personal communication.

Table 10. Age and sex composition and average length by age and sex of the Copper River District commercial catch of sockeye salmon, 1982.

	AGE											
	0.2	1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	3.2	3.3	TOTAL
MALES												
NUMBER	1,901	317	11,326	103,805	126	537,713	9,565	944	36,715	40	36	702,488
PERCENT	0.27	0.05	1.61	14.78	0.02	76.53	1.36	0.13	5.23	0.01	0.01	100.00
AV LENGTH	460.67	330.28	580.61	510.44	512.10	584.10	517.59	606.68	581.24	519.00	605.67	71.67
STD ERROR	11.08	8.98	5.60	2.94	0.00	1.13	8.66	10.26	4.38	22.00	0.00	1.96
SAMP SIZE	62	12	269	1,969	2	7,320	159	13	543	2	2	10,353
FEMALES												
NUMBER	614	47	10,987	59,188	0	381,034	8,453	237	30,336	0	0	490,896
PERCENT	0.13	0.01	2.24	12.06	0.00	77.61	1.72	0.05	6.18	0.00	0.00	100.00
AV LENGTH	484.04	302.50	564.19	513.52	0.00	564.46	507.54	614.64	565.40	0.00	0.00	557.29
STD ERROR	10.96	9.41	4.27	2.97	0.00	1.41	9.62	9.40	5.78	22.00	0.00	1.73
SAMP SIZE	23	2	286	1,310	0	5,627	149	4	465	0	0	7,866
SEXES COMBINED												
NUMBER	2,515	364	22,313	162,993	126	918,747	18,018	1,181	67,051	40	36	1,193,384
PERCENT	0.21	0.03	1.87	13.66	0.01	76.99	1.51	0.10	5.62	0.00	0.00	100.00
AV LENGTH	466.37	326.69	572.53	511.56	512.10	575.95	512.87	608.28	574.07	519.00	605.67	565.75
STD ERROR	11.02	9.14	4.87	2.96	0.00	1.22	9.06	10.02	4.85	22.00	0.00	1.86
SAMP SIZE	85	14	555	3,279	2	12,947	308	17	1,008	2	2	18,219

Table 11. Age and sex composition of the Copper River District commercial catch of sockeye salmon by calendar week, 1982.

		AGE											
		0.2	1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	3.2	3.3	TOTAL
SAMPLE PERIOD 1 5/16- 5/22													
PERIOD SAMPLE SIZE	1509												
MALE	COUNT	0	0	638	3989	0	120307	1436	160	9414	0	0	135944
	PERCENT	0.00	0.00	.26	1.66	0.00	49.97	.60	.07	3.91	0.00	0.00	56.46
FEMALE	COUNT	0	0	798	3032	0	92224	1276	160	7340	0	0	104830
	PERCENT	0.00	0.00	.33	1.26	0.00	38.30	.53	.07	3.05	0.00	0.00	43.54
SEXES COMBINED	COUNT	0	0	1436	7021	0	212531	2712	320	16754	0	0	240774
	PERCENT	0.00	0.00	.60	2.92	0.00	88.27	1.13	.13	6.96	0.00	0.00	100.00
SAMPLE PERIOD 2 5/23- 5/29													
PERIOD SAMPLE SIZE	2699												
MALE	COUNT	227	0	3183	21029	114	142656	3410	341	8071	0	0	179031
	PERCENT	.07	0.00	1.04	6.85	.04	46.50	1.11	.11	2.63	0.00	0.00	58.36
FEMALE	COUNT	227	0	2046	10344	0	103440	3524	0	8184	0	0	127765
	PERCENT	.07	0.00	.67	3.37	0.00	33.72	1.15	0.00	2.67	0.00	0.00	41.64
SEXES COMBINED	COUNT	454	0	5229	31373	114	246096	6934	341	16255	0	0	306796
	PERCENT	.15	0.00	1.70	10.23	.04	80.21	2.26	.11	5.30	0.00	0.00	100.00
SAMPLE PERIOD 3 5/30- 6/ 5													
PERIOD SAMPLE SIZE	2439												
MALE	COUNT	125	0	1188	11445	0	70797	1001	125	6004	0	0	90685
	PERCENT	.08	0.00	.78	7.50	0.00	46.41	.66	.08	3.94	0.00	0.00	59.45
FEMALE	COUNT	0	0	1689	6442	0	47906	1376	63	4378	0	0	61854
	PERCENT	0.00	0.00	1.11	4.22	0.00	31.41	.90	.04	2.87	0.00	0.00	40.55
SEXES COMBINED	COUNT	125	0	2877	17887	0	118703	2377	188	10382	0	0	152539
	PERCENT	.08	0.00	1.89	11.73	0.00	77.82	1.56	.12	6.81	0.00	0.00	100.00

-Continued-

Table 11. Age and sex composition of the Copper River District commercial catch of sockeye salmon by calendar week, 1982 (continued).

		AGE											
		0.2	1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	3.2	3.3	TOTAL
SAMPLE PERIOD 4 6/ 6- 6/12 PERIOD SAMPLE SIZE 1768													
MALE	COUNT	419	0	1989	22715	0	92743	1151	0	3559	0	0	122576
	PERCENT	.23	0.00	1.07	12.27	0.00	50.11	.62	0.00	1.92	0.00	0.00	66.23
FEMALE	COUNT	105	0	1465	10886	0	47210	523	0	2303	0	0	62492
	PERCENT	.06	0.00	.79	5.88	0.00	25.51	.28	0.00	1.24	0.00	0.00	33.77
SEXES COMBINED	COUNT	524	0	3454	33601	0	139953	1674	0	5862	0	0	185068
	PERCENT	.28	0.00	1.87	18.16	0.00	75.62	.90	0.00	3.17	0.00	0.00	100.00
SAMPLE PERIOD 5 6/13- 6/19 PERIOD SAMPLE SIZE 1891													
MALE	COUNT	148	74	1112	18386	0	52492	964	222	4522	0	0	77920
	PERCENT	.11	.05	.79	13.11	0.00	37.44	.69	.16	3.23	0.00	0.00	55.58
FEMALE	COUNT	0	0	1631	11047	0	45001	371	0	4226	0	0	62276
	PERCENT	0.00	0.00	1.16	7.88	0.00	32.10	.26	0.00	3.01	0.00	0.00	44.42
SEXES COMBINED	COUNT	148	74	2743	29433	0	97493	1335	222	8748	0	0	140196
	PERCENT	.11	.05	1.96	20.99	0.00	69.54	.95	.16	6.24	0.00	0.00	100.00
SAMPLE PERIOD 6 6/20- 6/26 PERIOD SAMPLE SIZE 1804													
MALE	COUNT	149	149	447	11587	0	26826	820	37	2981	0	0	42996
	PERCENT	.22	.22	.67	17.24	0.00	39.91	1.22	.06	4.44	0.00	0.00	63.97
FEMALE	COUNT	0	0	484	4806	0	16879	447	0	1602	0	0	24218
	PERCENT	0.00	0.00	.72	7.15	0.00	25.11	.67	0.00	2.38	0.00	0.00	36.03
SEXES COMBINED	COUNT	149	149	931	16393	0	43705	1267	37	4583	0	0	67214
	PERCENT	.22	.22	1.39	24.39	0.00	65.02	1.89	.06	6.82	0.00	0.00	100.00

-Continued-

Table 11. Age and sex composition of the Copper River District commercial catch of sockeye salmon by calendar week, 1982 (continued).

		AGE											
		0.2	1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	3.2	3.3	TOTAL
SAMPLE PERIOD 7 6/27- 7/ 3 PERIOD SAMPLE SIZE 1473													
MALE	COUNT	379	24	805	7147	0	11879	189	47	402	0	24	20896
	PERCENT	1.09	.07	2.31	20.50	0.00	34.08	.54	.13	1.15	0.00	.07	59.95
FEMALE	COUNT	95	47	781	5325	0	6909	284	0	521	0	0	13962
	PERCENT	.27	.13	2.24	15.28	0.00	19.82	.81	0.00	1.49	0.00	0.00	40.05
SEXES COMBINED	COUNT	474	71	1586	12472	0	18788	473	47	923	0	24	34858
	PERCENT	1.36	.20	4.55	35.78	0.00	53.90	1.36	.13	2.65	0.00	.07	100.00
SAMPLE PERIOD 8 7/ 4- 7/10 PERIOD SAMPLE SIZE 1570													
MALE	COUNT	238	20	337	5295	0	9279	238	0	714	40	0	16161
	PERCENT	.76	.06	1.08	17.01	0.00	29.80	.76	0.00	2.29	.13	0.00	51.91
FEMALE	COUNT	59	0	773	4977	0	8271	297	0	595	0	0	14972
	PERCENT	.19	0.00	2.48	15.99	0.00	26.57	.95	0.00	1.91	0.00	0.00	48.09
SEXES COMBINED	COUNT	297	20	1110	10272	0	17550	535	0	1309	40	0	31133
	PERCENT	.95	.06	3.57	32.99	0.00	56.37	1.72	0.00	4.20	.13	0.00	100.00
SAMPLE PERIOD 9 7/11- 7/17 PERIOD SAMPLE SIZE 338													
MALE	COUNT	10	0	10	160	0	381	15	0	39	0	0	615
	PERCENT	.61	0.00	.61	9.77	0.00	23.26	.92	0.00	2.38	0.00	0.00	37.55
FEMALE	COUNT	10	0	44	136	0	755	10	0	68	0	0	1023
	PERCENT	.61	0.00	2.69	8.30	0.00	46.09	.61	0.00	4.15	0.00	0.00	62.45
SEXES COMBINED	COUNT	20	0	54	296	0	1136	25	0	107	0	0	1638
	PERCENT	1.22	0.00	3.30	18.07	0.00	69.35	1.53	0.00	6.53	0.00	0.00	100.00

-Continued-

Table 11. Age and sex composition of Copper River District commercial catch of sockeye salmon by calendar week, 1982 (continued).

		AGE											
		0.2	1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	3.2	3.3	TOTAL
SAMPLE PERIOD 10 7/18- 7/24 PERIOD SAMPLE SIZE 1261													
MALE	COUNT	48	36	72	1152	12	5782	228	12	408	0	12	7762
	PERCENT	.32	.24	.48	7.61	.08	38.22	1.51	.08	2.70	0.00	.08	51.31
FEMALE	COUNT	24	0	120	912	0	5639	204	0	468	0	0	7367
	PERCENT	.16	0.00	.79	6.03	0.00	37.27	1.35	0.00	3.09	0.00	0.00	48.69
SEXES COMBINED	COUNT	72	36	192	2064	12	11421	432	12	876	0	12	15129
	PERCENT	.48	.24	1.27	13.64	.08	75.49	2.86	.08	5.79	0.00	.08	100.00
SAMPLE PERIOD 11 7/18- 7/31 PERIOD SAMPLE SIZE 257													
MALE	COUNT	74	0	923	222	0	2734	0	0	332	0	0	4285
	PERCENT	.78	0.00	9.72	2.34	0.00	28.80	0.00	0.00	3.50	0.00	0.00	45.14
FEMALE	COUNT	37	0	591	406	0	3805	0	0	369	0	0	5208
	PERCENT	.39	0.00	6.23	4.28	0.00	40.08	0.00	0.00	3.89	0.00	0.00	54.86
SEXES COMBINED	COUNT	111	0	1514	628	0	6539	0	0	701	0	0	9493
	PERCENT	1.17	0.00	15.95	6.62	0.00	68.88	0.00	0.00	7.38	0.00	0.00	100.00
SAMPLE PERIOD 12 8/ 1- 8/ 7 PERIOD SAMPLE SIZE 605													
MALE	COUNT	56	9	414	452	0	1224	75	0	179	0	0	2409
	PERCENT	.98	.16	7.27	7.94	0.00	21.50	1.32	0.00	3.14	0.00	0.00	42.32
FEMALE	COUNT	38	0	376	583	0	1995	94	9	188	0	0	3283
	PERCENT	.67	0.00	6.61	10.24	0.00	35.05	1.65	.16	3.30	0.00	0.00	57.68
SEXES COMBINED	COUNT	94	9	790	1035	0	3219	169	9	367	0	0	5692
	PERCENT	1.65	.16	13.88	18.18	0.00	56.55	2.97	.16	6.45	0.00	0.00	100.00

-Continued-

Table 11. Age and sex composition of Copper River District commercial catch of sockeye salmon by calendar week, 1982 (continued).

		AGE											
		0.2	1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	3.2	3.3	TOTAL
SAMPLE PERIOD 13 8/ 8- 8/14 PERIOD SAMPLE SIZE 605													
MALE	COUNT	28	5	208	226	0	613	38	0	90	0	0	1208
	PERCENT	.98	.18	7.29	7.92	0.00	21.48	1.33	0.00	3.15	0.00	0.00	42.33
FEMALE	COUNT	19	0	189	292	0	1000	47	5	94	0	0	1646
	PERCENT	.67	0.00	6.62	10.23	0.00	35.04	1.65	.18	3.29	0.00	0.00	57.67
SEXES COMBINED	COUNT	47	5	397	518	0	1613	85	5	184	0	0	2854
	PERCENT	1.65	.18	13.91	18.15	0.00	56.52	2.98	.18	6.45	0.00	0.00	100.00
PERIODS COMBINED SAMPLE SIZES COMBINED		18219											
MALE	COUNT	1901	317	11326	103805	126	537713	9565	944	36715	40	36	702488
	PERCENT	.16	.03	.95	8.70	.01	45.06	.80	.08	3.08	.00	.00	58.87
FEMALE	COUNT	614	47	10987	59188	0	381034	8453	237	30336	0	0	490896
	PERCENT	.05	.00	.92	4.96	0.00	31.93	.71	.02	2.54	0.00	0.00	41.13
SEXES COMBINED	COUNT	2515	364	22313	162993	126	918747	18018	1181	67051	40	36	1193384
	PERCENT	.21	.03	1.87	13.66	.01	76.99	1.51	.10	5.62	.00	.00	100.00

Table 12. Age and sex composition and average length by age and sex of the Copper River District commercial catch of chinook salmon, 1982.

	AGE										
	0.2	1.1	0.3	1.2	1.3	2.2	1.4	2.3	1.5	2.4	TOTAL
MALES											
NUMBER	51	107	18	2,956	13,535	386	7,823	2,456	22	1,483	28,837
PERCENT	0.17	0.37	0.06	10.25	46.94	1.34	27.13	8.52	0.08	5.14	100.00
AV LENGTH	545.41	448.24	849.00	643.89	880.90	597.01	988.56	854.07	1060.00	969.51	882.20
STD ERROR	0.00	11.75	0.00	10.71	4.87	22.29	6.55	12.86	0.00	17.16	7.53
SAMP SIZE	2	4	1	128	557	17	335	106	1	62	1,213
FEMALES											
NUMBER	0	0	0	732	12,462	82	4,606	1,644	26	773	20,325
PERCENT	0.00	0.00	0.00	3.60	61.32	0.40	22.66	8.09	0.13	3.80	100.00
AV LENGTH	0.00	0.00	0.00	660.92	860.64	633.21	955.70	837.28	992.00	943.12	875.49
STD ERROR	0.00	0.00	0.00	8.23	3.89	21.00	7.49	12.07	0.00	18.61	6.18
SAMP SIZE	0	0	0	34	527	4	196	73	1	32	867
SEXES COMBINED											
NUMBER	51	107	18	3,688	25,997	468	12,429	4,100	48	2,256	49,162
PERCENT	0.10	0.22	0.04	7.50	52.88	0.95	25.28	8.34	0.10	4.59	100.00
AV LENGTH	545.41	448.24	849.00	647.28	871.19	603.35	976.38	847.34	1023.17	960.47	879.42
STD ERROR	0.00	11.75	0.00	10.19	4.40	22.05	6.90	12.54	0.00	17.65	6.97
SAMP SIZE	2	4	1	162	1,084	21	531	179	2	94	2,080

Table 13. Age and sex composition and average length by age and sex of Copper River and Bering River District commercial catches of coho salmon, 1982.

Copper River

	Males			Females			Total		
Age	Number	Percent	Average Length mm	Number	Percent	Average Length mm	Number	Percent	Average Length mm
1.1	12	7.1	613.6	11	8.4	610.2	23	7.7	610.0
2.1	156	92.9	637.5	119	90.8	636.5	275	92.0	637.1
3.1				1	.8	680.0	1	.3	680.0
Total	168	56.2	635.8	131	43.8	634.6	299	100.0	635.3

Bering River

	Males			Females			Total		
Age	Number	Percent	Average Length mm	Number	Percent	Average Length mm	Number	Percent	Average Length mm
2.1	34	54.0	666.8	29	46.0	642.0	63	100.0	655.4

Source: Randall et al. (1983).

Table 14. Age and sex composition of average sockeye salmon sampled in the Bering River commercial catch in Controller Bay from 21 to 23 June, in the area east of Kayak Island from 14 to 16 June, and for the combined samples, 1982.

Controller Bay	AGE						
	0.2	0.3	1.2	1.3	2.2	2.3	Total
MALES							
NUMBER	1	2	37	56	2	6	104
PERCENT	0.50	1.10	19.80	29.90	1.10	3.20	55.60
FEMALES							
NUMBER	0	3	36	41	1	2	83
PERCENT	0.00	1.60	19.30	21.90	0.50	1.10	44.40
SEXES COMBINED							
NUMBER	1	5	73	97	3	8	187
PERCENT	0.50	2.70	39.10	51.80	1.60	4.30	100.00

Kayak Island							
	0.2	0.3	1.2	1.3	2.2	2.3	Total
MALES							
NUMBER	0	1	14	92	1	4	112
PERCENT	0.00	0.60	8.10	52.80	0.60	2.30	64.40
FEMALES							
NUMBER	0	1	2	55	1	3	62
PERCENT	0.00	0.60	1.10	31.60	0.60	1.70	35.60
SEXES COMBINED							
NUMBER	0	2	16	147	2	7	174
PERCENT	0.00	1.20	9.20	84.40	1.20	4.00	100.00

Controller Bay / Kayak Island Combined							
	0.2	0.3	1.2	1.3	2.2	2.3	Total
MALES							
NUMBER	1	3	51	148	3	10	216
PERCENT	0.30	0.80	14.10	41.00	0.80	2.80	59.80
FEMALES							
NUMBER	0	4	38	96	2	5	145
PERCENT	0.00	1.10	10.50	26.60	0.60	1.40	40.20
SEXES COMBINED							
NUMBER	1	7	89	244	5	15	361
PERCENT	0.30	1.90	24.60	67.60	1.40	4.20	100.00

Table 15. Age and sex composition of the early, middle, and late components of the Copper River subsistence catch of sockeye salmon, 1982.

		AGE							
		0.2	0.3	1.2	1.3	2.2	1.4	2.3	TOTAL
SAMPLE PERIOD 1 6/ 1- 6/21									
PERIOD SAMPLE SIZE 294									
MALE	COUNT	0	170	2,544	16,278	509	170	678	20,349
	PERCENT	0.00	.34	5.10	32.65	1.02	.34	1.36	40.82
FEMALE	COUNT	170	1,017	4,748	22,044	848	0	678	29,505
	PERCENT	.34	2.04	9.52	44.22	1.70	0.00	1.36	59.18
SEXES COMBINED	COUNT	170	1,187	7,292	38,322	1,357	170	1,356	49,854
	PERCENT	.34	2.38	14.63	76.87	2.72	.34	2.72	100.00
SAMPLE PERIOD 2 6/22- 7/20									
PERIOD SAMPLE SIZE 415									
MALE	COUNT	265	212	3,023	7,797	0	0	106	11,403
	PERCENT	1.20	.96	13.73	35.42	0.00	0.00	.48	51.81
FEMALE	COUNT	0	159	3,819	6,364	53	0	212	10,607
	PERCENT	0.00	.72	17.35	28.91	.24	0.00	.96	48.19
SEXES COMBINED	COUNT	265	371	6,842	14,161	53	0	318	22,010
	PERCENT	1.20	1.69	31.09	64.34	.24	0.00	1.44	100.00
SAMPLE PERIOD 3 7/21-9/30									
PERIOD SAMPLE SIZE 372									
MALE	COUNT	0	24	612	5,047	0	0	24	5,707
	PERCENT	0.00	.26	6.72	55.39	0.00	0.00	.26	62.64
FEMALE	COUNT	0	73	661	2,572	49	0	49	3,404
	PERCENT	0.00	.80	7.25	28.23	.54	0.00	.54	37.36
SEXES COMBINED	COUNT	0	97	1,273	7,619	49	0	73	9,111
	PERCENT	0.00	1.06	13.97	83.62	.54	0.00	.80	100.00
PERIODS COMBINED									
SAMPLE SIZES COMBINED 1,081									
MALE	COUNT	265	406	6,179	29,122	509	170	808	37,459
	PERCENT	.33	.50	7.63	35.96	.63	.21	1.00	46.26
FEMALE	COUNT	170	1,249	9,228	30,980	950	0	939	43,516
	PERCENT	.21	1.54	11.40	38.26	1.17	0.00	1.16	53.74
SEXES COMBINED	COUNT	435	1,655	15,407	60,102	1,459	170	1,747	80,975 [1]
	PERCENT	.54	2.04	19.03	74.22	1.80	.21	2.16	100.00

[1] Total catch is actually 96,799 but includes 15,824 fish with no date of capture information available. These fish could not be allocated to early, middle, or late portions of the catch and were not included in the subtotals for those portions which were in turn used to calculate weighted season total catches.

Age, Sex, and Size Composition of Escapements

Samples from the subsistence fishery were treated as representative of the upper Copper River run of sockeye salmon exclusive of the run to Long Lake (Table 16). Age groups 1.2 and 1.3 respectively represented 65.2% and 26.1% of the escapement to Long Lake (Table 17).

Although age groups 1.2 and 1.3 dominated most Copper River Delta escapements of sockeye salmon, there is a great deal of variation among individual Delta runs with other significant age groups in some runs (Tables 18 through 27). Age groups 0.2 and 0.3 represent more than 50% of the run to Ragged Point Lake and Martin River Slough and more than 10% of three others; the age group 1.1 was present in significant portions in two escapements on the Martin River drainage.

Age groups 1.2 and 1.3 dominated the Bering River escapements of sockeye salmon but, as in the Copper River Delta, there is notable variation among escapements (Tables 28 through 31). Fish with no freshwater check on their scales (age groups 0.2 and 0.3) were present in appreciable numbers in Bering Lake and Shepard Creek, and fish with two freshwater checks were present in appreciable numbers in Kushtaka Lake.

ACKNOWLEDGMENTS

The Cordova Area Management and Research Staffs provided all of the catch and escapement data in this report and portions of the age and sex composition data as well. The Area Staff also collected coho salmon catch samples, and Bob Gaylor assisted in collecting some of the chinook catch samples. In particular, the author thanks Rich Randall; he outlined the logistics of fisheries, made introductions to employees of local canneries, and regularly supplied catches and escapements. Ken Roberson supervised the collection of samples from the subsistence fishery on the Copper River. Peggy Merritt provided escapement data for sockeye salmon for the upper Copper River and important data on the migratory timing of individual stocks within that run. Erik Barth and Howard Schaller of Old Dominion University collected catch and escapement samples at Eyak Lake. Local residents of Long Lake volunteered their time and effort to run the weir at that site. Particular thanks are due Harley and Jo King, who donated housing for the sampling crew at Long Lake, their warm hospitality is deeply appreciated.

Bill Goshert of Stock Biology helped extensively in data entry and analysis, Scott Marshall and John Wilcock helped sample, Doug McBride helped sample and analyze the data, and Virginia Burton helped sample and provided clerical assistance. Dave Bernard's technical advice and exhaustive editing proved invaluable to the completion of this report.

Table 16. Age and sex composition of the early, middle, and late components of the sockeye salmon escapement to the upper Copper River, 1982.

		AGE							
		0.2	0.3	1.2	1.3	2.2	1.4	2.3	TOTAL
SAMPLE PERIOD 1 6/ 1- 6/21									
PERIOD SAMPLE SIZE 294									
MALE	COUNT	0	475	7,128	45,621	1,426	475	1,901	57,026
	PERCENT	0.00	.34	5.10	32.65	1.02	.34	1.36	40.82
FEMALE	COUNT	475	2,851	13,306	61,779	2,376	0	1,901	82,688
	PERCENT	.34	2.04	9.52	44.22	1.70	0.00	1.36	59.18
SEXES COMBINED	COUNT	475	3,326	20,434	107,400	3,802	475	3,802	139,714 [1]
	PERCENT	.34	2.38	14.63	76.87	2.72	.34	2.72	100.00
SAMPLE PERIOD 2 6/22- 7/20									
PERIOD SAMPLE SIZE 415									
MALE	COUNT	1,772	1,417	20,199	52,091	0	0	709	76,188
	PERCENT	1.20	.96	13.74	35.42	0.00	0.00	.48	51.81
FEMALE	COUNT	0	1,063	25,514	42,524	354	0	1,417	70,872
	PERCENT	0.00	.72	17.35	28.92	.24	0.00	.96	48.19
SEXES COMBINED	COUNT	1,772	2,480	45,713	94,615	354	0	2,126	147,060 [1]
	PERCENT	1.20	1.69	31.08	64.34	.24	0.00	1.45	100.00
SAMPLE PERIOD 3 7/21-9/30									
PERIOD SAMPLE SIZE 372									
MALE	COUNT	0	192	4,803	39,574	0	0	192	44,761
	PERCENT	0.00	.27	6.72	55.38	0.00	0.00	.27	62.63
FEMALE	COUNT	0	576	5,187	20,172	384	0	384	26,703
	PERCENT	0.00	.81	7.26	28.23	.54	0.00	.54	37.37
SEXES COMBINED	COUNT	0	768	9,990	59,746	384	0	576	71,464 [1]
	PERCENT	0.00	1.07	13.98	83.60	.54	0.00	.81	100.00
PERIODS COMBINED									
SAMPLE SIZES COMBINED 1,081									
MALE	COUNT	1,772	2,084	32,130	137,286	1,426	475	2,802	177,975
	PERCENT	.49	.58	8.97	38.32	.40	.13	.78	49.68
FEMALE	COUNT	475	4,490	44,007	124,475	3,114	0	3,702	180,263
	PERCENT	.13	1.25	12.28	34.75	.87	0.00	1.03	50.32
SEXES COMBINED	COUNT	2,247	6,574	76,137	261,761	4,540	475	6,504	358,238 [2]
	PERCENT	.63	1.84	21.25	73.07	1.27	.13	1.82	100.00

[1] Escapement totals for each portion of the run were estimated by subtracting catches in the subsistence fishery from sonar counts at Miles Lake lagged to account for travel time from the sonar site to the fishery. Long Lake weir counts were subtracted from the late component of the run.

[2] Total escapement is actually 342,414. Catches in the subsistence fishery included 15,824 fish with no date of capture reported. These fish could not be allocated to the early, middle, or late portion of the run hence were not subtracted from subtotals for those portions used to arrive at the season total in this table.

Table 17. Age and sex composition, and length by age and sex of the sockeye salmon escapement to Long Lake[1].

	AGE							
	1.1	1.2	2.1	1.3	2.2	2.3	3.2	TOTAL
MALES								
NUMBER	122	7,154	61	3,118	489	367	61	11,372
PERCENT	0.40	25.60	0.20	11.10	1.70	1.30	0.20	40.50
AV LENGTH	272.00	531.87	274.00	595.39	522.00	594.67	508.00	546.59
STD ERROR	39.00	1.64	0.00	3.01	8.56	7.04	0.00	2.87
SAMP SIZE	2	117	1	51	8	6	1	186
FEMALES								
NUMBER	0	11,067	0	4,219	795	550	61	16,692
PERCENT	0.00	39.60	0.00	15.00	2.80	1.90	0.20	59.50
AV LENGTH	0.00	509.39	0.00	570.46	515.23	563.78	545.00	527.03
STD ERROR	0.00	1.20	0.00	2.25	5.28	3.39	0.00	1.73
SAMP SIZE	0	181	0	69	13	9	1	273
SEXES COMBINED								
NUMBER	122	18,221	61	7,337	1,284	917	122	28,064
PERCENT	0.40	65.20	0.20	26.10	4.50	3.20	0.40	100.00
AV LENGTH	272.00	518.22	274.00	581.05	517.81	576.14	526.50	534.95
STD ERROR	39.00	1.37	0.00	2.57	6.53	4.85	0.00	2.19
SAMP SIZE	2	298	1	120	21	15	2	459

[1] Samples are from fish beach seined on the spawning grounds and below the weir at the lake outlet. Counts were taken daily at the weir.

Table 18. Age and sex composition, and length by age and sex of the combined sockeye salmon escapements to the Copper River Delta, 1982[1].

	AGE							
	0.2	1.1	0.3	1.2	1.3	2.2	2.3	TOTAL
MALES								
NUMBER	9,014	4,383	2,616	33,177	11,886	459	280	61,815
AV LENGTH	427.02	315.98	585.65	445.80	585.62	456.08	580.76	467.35
STD ERROR	2.44	2.46	6.26	1.53	2.64	6.37	8.69	2.23
SAMP SIZE	576	331	164	2,260	1,061	28	26	4,446
FEMALES								
NUMBER	1,211	33	6,105	11,009	23,066	229	352	42,005
AV LENGTH	476.19	312.33	566.14	487.94	560.97	505.19	561.64	539.64
STD ERROR	2.90	2.19	2.69	2.05	1.89	10.06	7.00	2.46
SAMP SIZE	79	2	382	772	1,864	14	30	3,143
SEXES COMBINED								
NUMBER	10,225	4,416	8,721	44,186	34,952	688	632	103,820
AV LENGTH	432.84	315.95	571.99	456.30	569.35	472.42	570.11	496.60
STD ERROR	2.63	2.37	3.84	1.72	2.24	7.66	7.97	2.33
SAMP SIZE	655	333	546	3,032	2,925	42	56	7,589

[1] Based on a weighted pool of data from the nine Delta systems sampled in 1982. The total escapement estimate based on aerial surveys was 115,780 but escapement estimates for spawning sites not sampled were not included in the estimate of total escapement to the Delta shown in this table (103,820 fish).

Table 19. Age and sex composition, and length by age and sex of the sockeye salmon escapement to Eyak Lake, 1982[1].

	AGE							
	0.2	1.1	0.3	1.2	1.3	2.2	2.3	TOTAL
MALES								
NUMBER	85	38	161	3,661	3,762	36	132	7,875
PERCENT	0.60	0.30	1.20	27.10	27.80	0.30	1.00	58.30
AV LENGTH	443.19	311.63	560.19	438.65	565.01	436.75	572.49	503.17
STD ERROR	8.62	10.34	10.05	1.52	1.96	8.79	7.36	2.16
SAMP SIZE	10	6	19	411	559	4	17	1,026
FEMALES								
NUMBER	9	0	181	531	4,794	0	110	5,625
PERCENT	0.10	0.00	1.30	4.00	35.50	0.00	0.80	41.70
AV LENGTH	469.00	0.00	544.85	476.83	545.02	0.00	559.59	538.74
STD ERROR	0.00	0.00	6.67	3.00	1.20	0.00	7.97	1.61
SAMP SIZE	1	0	20	60	662	0	14	757
SEXES COMBINED								
NUMBER	94	38	342	4,192	8,556	36	242	13,500
PERCENT	0.70	0.30	2.50	31.10	63.30	0.30	1.80	100.00
AV LENGTH	445.66	311.63	552.07	443.48	553.81	436.75	566.63	517.99
STD ERROR	7.84	10.34	8.32	1.71	1.55	8.79	7.64	1.93
SAMP SIZE	11	6	39	471	1,221	4	31	1,783

[1] Based on samples and aerial survey estimates from Hatchery Creek, middle arm, and north and south beaches. Power Creek was not sampled and aerial estimates for that site (75 fish) are not included.

Table 20. Age and sex composition, and length by age and sex of the sockeye salmon escapement to McKinley Lake, 1982[1].

	AGE							
	0.2	1.1	0.3	1.2	1.3	2.2	2.3	TOTAL
MALES								
NUMBER	1,190	94	623	11,726	3,248	321	57	17,259
PERCENT	5.20	0.40	2.70	51.10	14.10	1.40	0.20	75.10
AV LENGTH	430.48	327.00	588.52	448.88	590.51	452.35	575.33	479.12
STD ERROR	2.72	11.82	5.33	0.95	2.70	3.09	24.91	1.74
SAMP SIZE	63	5	33	621	172	17	3	914
FEMALES								
NUMBER	19	0	623	1,435	3,569	57	38	5,741
PERCENT	0.10	0.00	2.70	6.20	15.50	0.20	0.20	24.90
AV LENGTH	465.00	0.00	567.12	494.21	567.70	492.67	550.00	548.07
STD ERROR	0.00	0.00	4.78	3.25	1.91	14.62	30.00	2.86
SAMP SIZE	1	0	33	76	189	3	2	304
SEXES COMBINED								
NUMBER	1,209	94	1,246	13,161	6,817	378	95	23,000
PERCENT	5.30	0.40	5.40	57.30	29.60	1.60	0.40	100.00
AV LENGTH	431.02	327.00	577.82	453.82	578.57	458.43	565.20	496.33
STD ERROR	2.68	11.82	5.06	1.20	2.28	4.82	26.95	2.02
SAMP SIZE	64	5	66	697	361	20	5	1,218

[1] Based on samples from fish beach seined in McKinley Lake and carcasses sampled in Salmon Creek and the combined aerial survey estimates of escapement to both areas.

Table 21. Age and sex composition, and length by age and sex of the sockeye salmon escapement to 27-Mile Slough, 1982.

	AGE						
	0.2	1.1	0.3	1.2	1.3	2.3	TOTAL
MALES							
NUMBER	1,512	57	132	2,135	435	19	4,290
PERCENT	27.40	1.00	2.40	39.00	7.90	0.30	78.00
AV LENGTH	426.10	305.33	567.14	448.98	598.43	573.00	458.35
STD ERROR	2.92	10.65	10.11	2.03	5.55	0.00	3.05
SAMP SIZE	80	3	7	113	23	1	227
FEMALES							
NUMBER	76	19	208	113	794	0	1,210
PERCENT	1.30	0.30	3.70	2.00	14.70	0.00	22.00
AV LENGTH	441.75	303.00	566.00	473.50	570.79	0.00	548.57
STD ERROR	15.97	0.00	5.52	10.76	3.21	0.00	5.06
SAMP SIZE	4	1	11	6	42	0	64
SEXES COMBINED							
NUMBER	1,588	76	340	2,248	1,229	19	5,500 [1]
PERCENT	28.70	1.30	6.10	41.00	22.60	0.30	100.00
AV LENGTH	426.85	304.75	566.44	450.21	580.57	573.00	478.20
STD ERROR	3.54	7.99	7.30	2.47	4.04	0.00	3.49
SAMP SIZE	84	4	18	119	65	1	291

[1] Based on aerial survey estimate of escapement.

Table 22. Age and sex composition, and length by age and sex of the sockeye salmon escapement to 39-Mile Creek, 1982.

	AGE							
	0.2	1.1	0.3	1.2	1.3	2.2	2.3	TOTAL
MALES								
NUMBER	1,146	212	99	3,055	2,193	42	57	6,804
PERCENT	8.80	1.60	0.70	23.70	16.80	0.30	0.40	52.30
AV LENGTH	436.51	329.80	611.29	473.25	609.41	490.00	606.00	509.70
STD ERROR	2.92	5.13	11.17	2.64	2.01	18.19	6.49	2.82
SAMP SIZE	81	15	7	216	155	3	4	481
FEMALES								
NUMBER	127	0	226	1,938	3,722	42	141	6,196
PERCENT	0.90	0.00	1.70	14.90	28.90	0.30	1.00	47.70
AV LENGTH	475.89	0.00	572.37	509.04	582.94	517.33	567.20	556.44
STD ERROR	11.92	0.00	7.00	1.73	1.15	21.26	6.00	2.02
SAMP SIZE	9	0	16	137	263	3	10	438
SEXES COMBINED								
NUMBER	1,273	212	325	4,993	5,915	84	198	13,000 [1]
PERCENT	9.70	1.60	2.40	38.60	45.70	0.60	1.40	100.00
AV LENGTH	440.44	329.80	584.23	487.14	592.75	503.67	578.37	531.98
STD ERROR	3.82	5.13	8.27	2.29	1.47	19.73	6.14	2.44
SAMP SIZE	90	15	23	353	418	6	14	919

[1] Based on aerial survey estimate of escapement.

Table 23. Age and sex composition, and length by age and sex of the sockeye salmon escapement to Tokun Lake, 1982[1].

	AGE				
	1.1	0.3	1.2	1.3	TOTAL
MALES					
NUMBER	45	0	1,802	1,127	2,974
PERCENT	0.60	0.00	24.70	15.40	40.70
AV LENGTH	304.33	0.00	445.85	601.75	502.78
STD ERROR	4.05	0.00	2.13	2.42	2.27
SAMP SIZE	3	0	120	75	198
FEMALES					
NUMBER	0	15	255	4,056	4,326
PERCENT	0.00	0.20	3.50	55.60	59.30
AV LENGTH	0.00	569.00	488.18	563.36	558.93
STD ERROR	0.00	0.00	3.87	1.12	1.28
SAMP SIZE	0	1	17	270	288
SEXES COMBINED					
NUMBER	45	15	2,058	5,182	7,300
PERCENT	0.60	0.20	28.20	71.00	100.00
AV LENGTH	304.33	569.00	451.11	571.71	536.06
STD ERROR	4.05	0.00	2.34	1.40	1.68
SAMP SIZE	3	1	137	345	486

[1] Based on samples and aerial survey estimates of escapement for Tokun Lake and its outlet. Tokun River and Tokun Springs were not sampled and aerial survey estimates for these sites (1,150 fish) were not included in this table.

Table 24. Age and sex composition, and length by age and sex of the sockeye salmon escapement to Little Martin Lake, 1982.

	AGE					
	0.2	1.1	0.3	1.2	1.3	TOTAL
MALES						
NUMBER	275	1,601	0	2,268	72	4,216
PERCENT	4.50	26.50	0.00	37.90	1.10	70.00
AV LENGTH	415.00	319.01	0.00	430.41	558.00	389.28
STD ERROR	3.66	1.69	0.00	1.38	12.69	1.84
SAMP SIZE	23	134	0	190	6	353
FEMALES						
NUMBER	48	0	96	919	741	1,804
PERCENT	0.70	0.00	1.50	15.50	12.30	30.00
AV LENGTH	474.50	0.00	546.62	470.12	553.39	508.51
STD ERROR	12.90	0.00	4.62	2.50	3.64	3.36
SAMP SIZE	4	0	8	77	62	151
SEXES COMBINED						
NUMBER	323	1,601	96	3,187	813	6,020 [1]
PERCENT	5.20	26.50	1.50	53.40	13.40	100.00
AV LENGTH	423.84	319.01	546.62	441.86	553.80	425.01
STD ERROR	5.03	1.69	4.62	1.70	4.44	2.29
SAMP SIZE	27	134	8	267	68	504

[1] Based on aerial survey estimate of escapement.

Table 25. Age and sex composition, and length by age and sex of the sockeye salmon escapement to Martin Lake, 1982[1].

	AGE							
	0.2	1.1	0.3	1.2	1.3	2.2	2.3	TOTAL
MALES								
NUMBER	238	1,985	28	5,267	154	28	0	7,700
PERCENT	1.60	13.40	0.20	35.60	1.00	0.20	0.00	52.00
AV LENGTH	423.41	312.16	600.50	437.02	565.00	452.00	0.00	407.62
STD ERROR	3.77	1.69	17.50	1.08	16.78	18.00	0.00	1.75
SAMP SIZE	17	142	2	377	11	2	0	551
FEMALES								
NUMBER	70	14	196	3,899	2,893	14	14	7,100
PERCENT	0.50	0.10	1.30	26.40	19.50	0.10	0.10	48.00
AV LENGTH	447.80	325.00	549.00	477.97	548.99	510.00	599.00	508.57
STD ERROR	7.32	0.00	6.33	1.12	1.81	0.00	0.00	1.60
SAMP SIZE	5	1	14	279	207	1	1	508
SEXES COMBINED								
NUMBER	308	1,999	224	9,166	3,047	42	14	14,800
PERCENT	2.10	13.50	1.50	61.90	20.60	0.30	0.10	100.00
AV LENGTH	428.95	312.25	555.44	454.44	549.80	471.33	599.00	456.05
STD ERROR	4.58	1.68	7.73	1.09	2.57	12.00	0.00	1.68
SAMP SIZE	22	143	16	656	218	3	1	1,059

[1] Based on samples from fish beach seined on the west side of the lake and from carcasses in the feeder streams and the combined aerial survey estimates of escapement to the lake and the feeder streams.

Table 26. Age and sex composition, and length by age and sex of the sockeye salmon escapement to Ragged Point Lake, 1982[1].

	AGE							
	0.2	1.1	0.3	1.2	1.3	2.2	2.3	TOTAL
MALES								
NUMBER	1,028	118	1,265	1,737	472	17	0	4,637
PERCENT	9.00	1.00	11.00	15.10	4.10	0.10	0.00	40.30
AV LENGTH	437.75	324.00	591.67	450.38	575.39	516.00	0.00	495.86
STD ERROR	3.13	7.46	4.09	2.56	7.39	0.00	0.00	3.71
SAMP SIZE	61	7	75	103	28	1	0	275
FEMALES								
NUMBER	422	0	3,592	1,298	1,416	101	34	6,863
PERCENT	3.70	0.00	31.20	11.30	12.30	0.90	0.30	59.70
AV LENGTH	492.32	0.00	572.17	497.68	562.87	512.50	547.50	550.25
STD ERROR	5.59	0.00	1.23	2.74	2.49	5.43	23.50	2.21
SAMP SIZE	25	0	213	77	84	6	2	407
SEXES COMBINED								
NUMBER	1,450	118	4,857	3,035	1,888	118	34	11,500
PERCENT	12.60	1.00	42.20	26.40	16.40	1.00	0.30	100.00
AV LENGTH	453.62	324.00	577.25	470.61	566.00	513.00	547.50	528.31
STD ERROR	3.85	7.46	1.97	2.64	3.71	4.65	23.50	2.82
SAMP SIZE	86	7	288	180	112	7	2	682

[1] Based on samples and aerial survey estimates of escapement from the lake and the lake outlet. Ragged Point River was not sampled and aerial estimates of escapement to that site are not included in this table.

Table 27. Age and sex composition, and length by age and sex of the sockeye salmon escapement to Martin River Slough, 1982.

	AGE							
	0.2	1.1	0.3	1.2	1.3	2.2	2.3	TOTAL
MALES								
NUMBER	3,539	235	308	1,600	470	15	15	6,182
PERCENT	37.30	2.50	3.20	16.80	4.90	0.20	0.20	65.10
AV LENGTH	420.84	312.06	566.81	428.65	578.22	427.00	588.00	438.38
STD ERROR	1.39	3.40	8.08	2.40	4.76	0.00	0.00	2.31
SAMP SIZE	241	16	21	109	32	1	1	421
FEMALES								
NUMBER	440	0	969	631	1,248	15	15	3,318
PERCENT	4.60	0.0	10.20	6.60	13.10	0.20	0.20	34.90
AV LENGTH	472.10	0.00	551.06	488.19	553.87	465.00	551.00	529.30
STD ERROR	7.39	0.00	2.80	5.18	2.46	0.00	0.00	3.71
SAMP SIZE	30	0	66	43	85	1	1	226
SEXES COMBINED								
NUMBER	3,979	235	1,277	2,231	1,718	30	30	9,500 [1]
PERCENT	41.90	2.50	13.40	23.40	18.00	0.40	0.40	100.00
AV LENGTH	426.51	312.06	554.86	445.49	560.53	446.00	569.50	470.14
STD ERROR	2.06	3.40	4.08	3.19	3.09	0.00	0.00	2.80
SAMP SIZE	271	16	87	152	117	2	2	647

[1] Based on aerial survey estimate of escapement.

Table 28. Age and sex composition, and length by age and sex of the combined sockeye salmon escapement to the Bering River drainage, 1982[1].

	AGE								
	0.2	1.1	0.3	1.2	2.1	1.3	2.2	2.3	TOTAL
MALES									
NUMBER	861	184	926	5,329	16	6,728	131	229	14,405
PERCENT	2.80	0.60	3.00	17.60	0.10	22.20	0.40	0.80	47.50
AV LENGTH	426.44	323.46	587.01	452.76	347.75	572.77	461.72	538.44	515.55
STD ERROR	5.03	7.53	5.02	2.63	5.80	2.10	4.07	4.73	2.80
SAMP SIZE	55	19	59	403	4	582	29	44	1,195
FEMALES									
NUMBER	16	0	1,601	2,992	0	10,975	148	214	15,946
PERCENT	0.10	0.00	5.30	9.80	0.00	36.10	0.50	0.70	52.50
AV LENGTH	510.00	0.00	547.63	475.10	0.00	536.84	474.08	530.73	525.65
STD ERROR	0.00	0.00	3.54	2.41	0.00	1.47	2.72	5.64	1.97
SAMP SIZE	1	0	103	278	0	868	33	35	1,318
SEXES COMBINED									
NUMBER	877	184	2,527	8,321	16	17,703	279	443	30,350
PERCENT	2.90	0.60	8.30	27.40	0.10	58.30	0.90	1.50	100.00
AV LENGTH	427.96	323.46	562.06	460.79	347.75	550.50	468.28	534.71	520.85
STD ERROR	4.94	7.53	4.08	2.54	5.80	1.72	3.35	5.13	2.37
SAMP SIZE	56	19	162	681	4	1,450	62	79	2,513

[1] Based on a weighted pool of data from three Bering River systems sampled in 1982. The total of the aerial survey estimates of escapement to all sites was 35,650 but some sites were not sampled and the estimates of escapement to those sites (5,300 fish) were not included in the total estimate of escapement shown in this table (30,350 fish).

Table 29. Age and sex composition, and length by age and sex of the sockeye salmon escapement to Kushtaka Lake, 1982[1].

	AGE								
	0.2	1.1	0.3	1.2	2.1	1.3	2.2	2.3	TOTAL
MALES									
NUMBER	4	41	4	375	16	883	115	165	1,603
PERCENT	0.10	1.20	0.10	11.20	0.50	26.40	3.40	4.90	47.80
AV LENGTH	405.00	317.70	521.00	467.53	347.75	534.57	464.46	526.97	505.31
STD ERROR	0.00	6.48	0.00	2.63	5.80	1.65	4.22	3.29	2.39
SAMP SIZE	1	10	1	91	4	214	28	40	389
FEMALES									
NUMBER	0	0	12	499	0	985	132	119	1,747
PERCENT	0.00	0.00	0.40	14.90	0.00	29.40	3.90	3.60	52.20
AV LENGTH	0.00	0.00	519.67	463.29	0.00	524.70	473.00	516.28	502.64
STD ERROR	0.00	0.00	13.32	1.83	0.00	1.46	2.81	4.18	1.94
SAMP SIZE	0	0	3	121	0	239	32	29	424
SEXES COMBINED									
NUMBER	4	41	16	874	16	1,868	247	284	3,350
PERCENT	0.10	1.20	0.50	26.10	0.50	55.80	7.30	8.50	100.00
AV LENGTH	405.00	317.70	520.00	465.11	347.75	529.37	469.02	522.49	503.92
STD ERROR	0.00	6.48	9.99	2.17	5.80	1.55	3.47	3.67	2.15
SAMP SIZE	1	10	4	212	4	453	60	69	813

[1] Based on samples and aerial survey estimates of escapement for the lake and Shokum Creek.

Table 30. Age and sex composition, and length by age and sex of the sockeye salmon escapement to Shepard Creek, 1982[1].

	AGE						
	0.2	0.3	1.2	1.3	2.2	2.3	TOTAL
MALES							
NUMBER	80	588	1,304	2,960	16	16	4,964
PERCENT	0.80	5.60	12.40	28.10	0.20	0.20	47.30
AV LENGTH	427.40	586.19	480.05	586.80	442.00	560.00	555.56
STD ERROR	21.05	3.95	5.18	1.88	0.00	0.00	3.29
SAMP SIZE	5	37	82	186	1	1	312
FEMALES							
NUMBER	16	827	970	3,723	0	0	5,536
PERCENT	0.10	7.90	9.20	35.50	0.00	0.00	52.70
AV LENGTH	510.00	536.50	480.38	538.37	0.00	0.00	527.85
STD ERROR	0.00	3.09	3.52	1.38	0.00	0.00	2.01
SAMP SIZE	1	52	61	234	0	0	348
SEXES COMBINED							
NUMBER	96	1,415	2,274	6,683	16	16	10,500
PERCENT	0.90	13.50	21.60	63.60	0.20	0.20	100.00
AV LENGTH	441.03	557.15	480.19	559.82	442.00	560.00	540.95
STD ERROR	17.55	3.45	4.47	1.60	0.00	0.00	2.61
SAMP SIZE	6	89	143	420	1	1	660

[1] Based on samples and aerial survey estimates of escapement to Shepard Creek and does not include samples or survey estimates of escapement for Carbon Creek, a clear water tributary which may have different rearing conditions.

Table 31. Age and sex composition, and length by age and sex of the sockeye salmon escapement to Bering Lake, 1982[1].

	AGE							
	0.2	1.1	0.3	1.2	1.3	2.2	2.3	TOTAL
MALES								
NUMBER	777	143	333	3,649	2,888	0	48	7,838
PERCENT	4.70	0.90	2.00	22.10	17.50	0.00	0.30	47.50
AV LENGTH	426.45	325.11	589.24	441.48	570.07	0.00	570.67	492.32
STD ERROR	3.50	8.69	7.13	1.72	2.87	0.00	25.44	2.82
SAMP SIZE	49	9	21	230	182	0	3	494
FEMALES								
NUMBER	0	0	762	1,523	6,266	16	95	8,662
PERCENT	0.00	0.00	4.60	9.20	38.00	0.10	0.60	52.50
AV LENGTH	0.00	0.00	560.15	475.60	537.84	483.00	548.83	528.88
STD ERROR	0.00	0.00	3.41	2.43	1.53	0.00	12.71	1.97
SAMP SIZE	0	0	48	96	395	1	6	546
SEXES COMBINED								
NUMBER	777	143	1,095	5,172	9,155	16	143	16,500
PERCENT	4.70	0.90	6.60	31.30	55.50	0.10	0.90	100.00
AV LENGTH	426.45	325.11	569.00	451.53	548.01	483.00	556.16	511.51
STD ERROR	3.50	8.69	4.54	1.93	1.95	0.00	16.95	2.37
SAMP SIZE	49	9	69	326	577	1	9	1,040

[1] Based on samples and aerial survey estimates of escapement from Dick Creek and the beaches on lake.

LITERATURE CITED

Clutter, R. and L. Whitesel. 1956. Collection and interpretation of sockeye salmon scales. Bull. Int. Pac. Salmon Fish. Comm., No. 9. 159 pp.

International North Pacific Fisheries Commission. 1963. Annual Report for 1961. 167 pp.

Merritt, M. and K. Roberson. 1983. Copper River sockeye salmon sonar enumeration studies. Alaska Department of Fish and Game, Prince William Sound Data Report No. 83-2. 23 pp.

Merritt, M. and K. Roberson. (In press). Migratory timing of upper Copper River sockeye salmon stocks, and its management implications to the commercial fishery. Alaska Department of Fish and Game. Glennallen, Alaska.

Randall, R., P. Fridgen, M. McCurdy, and K. Roberson. 1983. Prince William Sound Area Annual Finfish Management Report, 1982. Alaska Department of Fish and Game, Division of Commercial Fisheries. Annual Management Report Series. 128 pp.

Roberson, K. 1982. Copper River subsistence salmon fishery management and research. Report to the Alaska Board of Fisheries. Glennallen, Alaska. December 1982.

Sharr, S. 1983. Separating major runs in the Copper-Bering River sockeye salmon *(Oncorhynchus nerka)* fishery with scale pattern analysis. Alaska Department of Fish and Game. Informational Leaflet No. 218. 23 pp.

Tesch, F. 1970. Age and growth, p. 98-126. In Methods for assessment of fish production in fresh waters. W.E. Ricker (ed.). IBP Handbook No. 3. Blackwell Scientific Publications, Oxford and Edinburgh.

Personal Communications

Fridgen, P. 1982. Alaska Department of Fish and Game. Cordova, Alaska.

Roberson, K. 1983. Alaska Department of Fish and Game. Glennallen, Alaska.

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